12/2/98-00496

MEETING SUMMARY CH2MHILL

St. Juliens Creek Annex Site Visit and Review of Comments and Issues

ATTENDEES: See Attached Sign-up Sheet

FROM: Mike Tilchin

Meeting DATE: December 2, 1998

Representatives of LANTDIV, COMNAVBASE, VDEQ, US EPA, NOAA/BTAG, US Fish and Wildlife, and LANTDIV's Navy CLEAN II Contractors, CDM Federal and CH2M HILL, completed a site visit of St. Juliens Creek Annex on the morning of 12/2/98. The participant list is included as Attachment A. Each of the four sites for which supplemental investigations have been proposed (Landfill B, Burning Ground, Landfill C, and Landfill D) were visited. Site maps were provided showing previous and proposed sampling locations. In addition, proposed sampling locations for the background study were pointed out during a "windshield tour" of the Annex.

Following the site visit, the group convened to discuss EPA and VDEQ comments on the supplemental investigations and the background study, and the Navy's response to those comments. The agenda for the meeting is included as Attachment B.

Tim Reisch/LANTDIV chaired the meeting, and opened the meeting by asking the group if there were any new issues that came to light as a result of what was observed and discussed during the morning's site visit.

Tim reviewed the list of documents submitted to date. Tim discussed that the RI results from the first phase of the investigation brought to light gaps in the environmental data, and the supplemental investigations were designed to fill those gaps. Tim emphasized that the Ecological Risk Assessment submittal was, on the basis of a consensus decision with EPA and VDEQ, submitted as a "Work In Progress" where the basic approach and assumptions were to be reviewed and finalized before the draft ERA was prepared. Tim expressed concern that reviewers had considered the ERA Work in Progress a complete draft, as reflected in the review comments on the incompleteness of the submittal.

Simeon Hahn/BTAG stated that he understood that the ERA was a work in progress, but it still wasn't obvious that the approved ERA process steps were being followed. Tim agreed that the ERA process steps weren't reflected in the ERA Work in Progress, but that was only because the Navy hadn't really started the process yet.

In discussing the Navy's response to comments, Tim noted the issues raised tended to overlap across the proposed supplemental investigations, and therefore it made the most sense to organize the discussion based on technical issues, rather than going site-by-site.

Rob Thomson/EPA asked whether the intent of the Navy was to finalize the RI for the four sites. Tim confirmed that the objective of the supplemental investigations was to define the nature and extent of contamination for all four sites. Once nature and extent was determined, then the steps in the screening process would begin.

Tim handed out a *Summary* of the Response to Comments. Tim pointed out that this *Summary* is not the same as the Response to Comments that had already been submitted to VDEQ and EPA, although

it was organized similarly, by issue. Again, the issues are common to all of the four sites. Tim stated that the information in each *Summary* is organized by the priority of the issues raised in the review comments received from VDEQ and EPA. Three levels were used to organize the comments for discussion purposes: Priority A – technical issues requiring discussion between the Navy, EPA, and VDEQ; Priority B – technical issues resolved in the Navy's response to comments that warranted group concurrence on the issue resolution, Priority C – comment recommendations incorporated into revised section (text, tables, and figures) of the workplan. The group discussed the priority A issues first to ensure that they could be discussed while all participants were together.

Background Sampling

The first issue discussed was EPA and VDEQ's request that all prospective soil samples for the background study be analyzed for organic contamination. Tim noted that the intended use of the background data was to use the data to help in the risk management decision process for inorganic analytes. Organic compounds in soils found at sites were assumed to reflect site-related contamination. Tim noted that the sampling approach in the proposed background study was based on the approach used at the Yorktown Weapons Station, and at several other bases that EPA had recommended as examples.

Rob Thomson stated that the reason for sampling for organics was to confirm that the location used for background was not impacted by human activity. Sharon Wilcox/VDEQ stated that the presence of organic contamination may invalidate a sample as representative of background.

Dave Schroeder/CDM stated that under a threshold that defined a useable background sample as one that had no organic contamination above detection levels, there would be no locations at St. Juliens that could be used. Not only would the Navy analyze for compounds that would not be used for any comparison purposes, it was likely that no samples would be useable at all based on the suggested criteria for defining an acceptable background location.

Rob Thomson stated that if your going to use samples for background, than you have to demonstrate that there hasn't been any human activity at that location. He noted that EPA's toxicologists required that more complete analysis in order to use samples for background determination.

Simeon Hahn/BTAG stated that background concentrations could not be used in the ERA process, only in the risk management process.

Steve Petron/CH2M HILL responded that the risk management decision process may indeed take into account background concentrations. Simeon Hahn confirmed that background concentrations could be used at "Step 8" of the ERA process. Steve Petron felt that you could drop contaminants for risk management purposes. Simeon replied that the process does not allow for "dropping out" of contaminants on the basis of background concentrations, alone.

Mike Tilchin/CH2M HILL mentioned that the proposed approach to defining naturally occurring levels of inorganics at St. Juliens was based both on where the samples were taken, but perhaps even to a greater extent, based on taking a large enough number of samples to ensure that the definition of background was statistically valid. By taking enough samples, it actually didn't matter if by some chance the Navy hit an unknown hot spot. There were also statistical techniques for defining anomalies that would, in fact, allow the Navy to identify a particular sample that should not be included in a background determination. Mike also asked for the basis of the thinking that detectable levels of organics had any correlation to elevated metals concentrations.

Steve Petron noted that under this approach, a sample that had very low natural levels of inorganics, but had detectable concentrations of organics, would be discarded from the background determination.

Simeon Hahn stated that we know St. Juliens is in an impacted area, but that should not be a basis for not cleaning up. Rob Thomson replied that without data on organics, you can't tell if you have a non-impacted background location.

Simeon Hahn stated that background levels were a minimal part of the ecological risk assessment, and that with the available data, we were past the first decision point of concluding that there's a need for ecological risk assessment. Simeon stated that the process was at a point where we needed to get the list of COCs to a manageable number in order to move ahead.

Dave Schroeder asked for clarification as to whether or not samples would be discarded if organics were present. Rob Thomson replied that the samples would not be automatically discarded, but would be given a closer look.

Sharon Wilcox/VDEQ stated that it was known that there was bad housekeeping at St. Juliens in the past, and that aerial photos were not reliable in determining whether or not a particular location hadn't been contaminated through past site activities. Sharon said that a full analysis for inorganic and organic compounds gives a stronger sense of security that a background sample is really clean.

As support for the need to analyze for organics, Rob Thomson cited a case at another site where arsenic found in a proposed background sample was the result of pesticide disposal.

Tim Reisch said that the Navy read the comment about background samples needing to reflect "no human activity", but now understands that there's some flexibility there. With that better understanding of EPA and VDEQ's position, the Navy would give some more thought to the background study.

Sediment Sampling

The other Priority A issues involved the sediment sampling in St. Juliens Creek and in Blows Creek for use in the ERA process. At this point in the meeting, Tim asked Steve Petron to lead the discussion.

Landfill B

John McCloskey/US Fish and Wildlife said that when establishing background for sediments, if you're taking samples right at the Annex's boundary, you may have contaminants from upstream sources, and you could overstate the background contamination levels that exist immediately upstream of the site.

Simeon Hahn stated that he wanted the sampling approach to allow for determining contamination gradients in the water body.

Steve Petron said that it was still relevant and important from a risk management perspective to understand what contaminants were moving onto the Annex across the boundary. For example, a clean-up decision should consider whether or not the site would be recontaminated from upstream sources.

It was noted that EPA and BTAG had not received the Navy's response to comments, which included additional sediment sampling locations. Steve Petron showed these proposed sampling locations in St. Juliens Creek near the outfall of Landfill B, and in a tight ring around the outfall. The goal is to determine what's coming right from the source- even though it's tidal, this is still the

most likely location to evaluate impact. Before that information was known, the Navy didn't want to start evaluating a larger and much more complex system known to be influenced by numerous other sources.

Simeon Hahn felt that this approach was going to prolong the process, and that the Navy should go forward with more sampling in St. Juliens Creek.

Mike Tilchin stated that the goal getting to cleanup quickly and efficiently was the same among organizations, but that there's a difference in strategy for how to get there. The Navy wants to study, evaluate, and close specific sites, and that by expanding into larger systems outside of the area impacted by the site would prolong the process. The more complex system could then be the focus of a separate study.

John McCloskey stated that additional samples were still needed to assess the potential area of immediate impact from Landfill B.

Steve Petron showed the locations of the four proposed reference sediment samples (in addition to the outfall location) in St. Juliens Creek. Steve referred to John's concerns about sampling right at the outfall (the potential for scour), and the idea of relocating some of the proposed reference sampling locations to get more of a gradient. It was agreed to locate two of the reference samples in the corners of the cove containing the outfall, and the other two reference locations outside the cove - one upstream and one downstream.

Simeon Hahn asked about the difference between a reference and background sample. Steve Petron said that a reference sample typically would not be used to define background, and that this was particularly so under the strict criteria for background being discussed.

Simeon Hahn proposed a redistribution of the background samples, bringing them closer to the site by spreading them out . If the Navy still wanted to keep the integrity of the four background samples, Simeon proposed adding another reference sample between the background sampling area and the area right around the discharge of Landfill B. It was agreed to add a reference sediment sampling location where the tributary containing the background samples enters St. Juliens Creek. This would bring the total number of reference sample locations in St. Juliens Creek to five.

Simeon stated that the current data were sufficient for the screening step, and that these samples were part of the design of the risk assessment.

Tim Reisch said that if the Navy felt it had done the first screen, then they would be moving forward with writing the RI and the risk assessments, and wouldn't be planning to take more samples. Tim said the Navy doesn't think it's there yet; these supplemental workplans are to assist in the defining the nature and extent of contamination at the sites under investigation.

Simeon Hahn said that he wasn't aware of an overall risk assessment framework for St. Juliens. For example, a habitat evaluation was needed to define the receptor species, and the list of COC's needed to be refined.

Sharon Wilcox said to be sure that the work plan provided enough information and guidance to help the sampling teams make smart decisions on specific sampling areas when they are in the field. For example, they should focus sampling on depositional areas. She said the field team personnel should be capable of using the information in the workplan and professional judgement/experience to make decisions in the field while conducting the sampling event.

Simeon Hahn recommended that the Navy do toxicity testing while doing the next round of chemistry. He strongly recommended toxicity testing in the wetland areas. Simeon stated that he

thought the Navy would otherwise end up going back to do toxicity testing at a later date, and would have to do duplicative chemistry work at that time.

Steve Petron acknowledged that there was some risk of duplicating some work if the Navy goes back to do toxicity testing, and that would be considered in the development of the approach. Steve also mentioned that it is important to keep in mind that this information would be utilized to develop more focused workplans for toxicity testing to ensure that the data required is the data collected. It was also important to be sure that one understood the potential for contamination and risk well enough to strategically locate and focus additional sampling and studies.

Simeon Hahn expressed concern that there's not much in the work plan on ERA. He noted that the document doesn't discuss endpoints or other essential pieces.

Tim Reisch acknowledged that the initial workplans address the approach to completing the ERAs and do not contain specifics. He mentioned that the "Work in Progress" contained more information, but that it also did not contain all the information to complete the ERAs; however, all pieces that were missing will be included.

Comments on Sample Collection and Analysis

After a short break, the group continued the meeting; however, while Steve Petron was revising travel arrangements the group discussed several items that did not require Steve's participation.Tim Reisch moved on to specific changes made in response to EPA and VDEQ comments, Priority B issues. Tim stated that these issues fell into several areas, and that they may apply to one or more of the workplan review comments :

Surface Soil Sampling Intervals: It was resolved that the interval for future samples would be 0-6 inches, but that previous samples from 0- 3 inches would still be valid. The group concurred with the Navy's response to this issue.

Composite Sampling Interval: This had originally been set at 0-3 feet. Comments expressed concern that 3 feet was too deep, and would be modified to be 0 –2 feet. The group concurred with the Navy's response to this issue.Both John McCloskey and Simeon Hahn stated that if the 0 – 2 foot composite samples were being collected for ERA purposes only, they weren't necessary. Surface soils alone were all that were needed for ecological risk. The Navy requested that if the samples would not needed, they be deleted from the workplans; the group concurred that this was reasonable. Tim stated the Navy would make revisions to reflect this decision and that they would be provided as attachments to the minutes of the meeting.

Low Level VOCs: (Discussed Below)

Sediment Sampling (continued)

Blows Creek

Steve Petron noted that the data collection for Blows Creek focused the data collection effort on the sites (Burning Ground and Landfill D). Steve showed the proposed locations associated with the specific RIs at these sites on an overhead. It was noted that one of the sampling locations was shown coming from the wrong tributary finger, and the change was noted and will be corrected. Steve also pointed out the location of the 4 background sediments locations proposed for Blows Creek.

Steve Petron mentioned that the ditch from the Burning Ground had been sampled during the past investigation, and that the next round of sampling would be focused on overland flow from the site. Sharon Wilcox asked about the age of the ditch leading to Blows Creek.

Rob Thomson pointed out that aerial photos indicated a potential site near one of the reference locations. Tim Reisch will check that location (**ACTION ITEM**).

Simeon Hahn recommended that there be more sampling in Blows Creek near the Burning Ground. He felt that the number of samples proposed (including the background study) was about right, but that better spatial coverage was needed.

The discussion focused on the presence of a berm along the drainage ditch near the Burning Ground, and how that should influence sampling locations. The date of construction of the berm would be investigated (**ACTION ITEM**- Tim).

Simeon Hahn put up proposed sampling locations along Blows Creek on the overhead.

Simeon Hahn stated that the "managed surfaces" of the Landfills C and D are fairly low in terms of habitat value because they are mowed. As part of closure, the Navy may want to consider more natural surface vegetation to improve habitat quality

As an **ACTION ITEM**, the Navy agreed to formulate a more detailed risk assessment framework for review.

Simeon Hahn reiterated his recommendation that the Navy should consider including direct toxicity testing when they do the next round of chemical sampling. He also noted that if the next attempt to get surface water samples from the ditch at Site 2 didn't work out because of lack of water, it would be OK to drop that location.

Dave Schroeder noted that there were several Landfill C locations that were under water at the time of the first site visit, but never since.

Sharon Wilcox asked about the potential significance of tidal influence on the wells. The measured degree of fluctuation from the previous study was discussed.

Simeon Hahn stated that he didn't think surface water samples were particularly important for ecological risk. The Navy pointed out that they were still needed to support the human health risk assessment.

Tim said the Navy would review the sediment sampling locations currently proposed for St. Juliens Creek and Blows Creek prior to distributing the minutes. Tim stated the Navy may be able to provide an alternative sediment sampling approach as an attachment to the meeting minutes based on the comments received during the meeting.

Comments on Sample Collection and Analysis (continued)

The discussion returned to the comment on performing low level VOC analysis on surface water samples. The Navy agreed to use low-level VOC for surface water, and it was agreed that previous samples are still valid.

An issue concerning the determination of the landfill boundary sampling was resolved. Specifically, if samples collected to assist in delineating the aerial extent of a site are found not to contain significant levels of contamination and they are determined not to be within the boundary of the site, then the analytical results from those samples will not be used to calculate site related risk. Rob Thomson asked if the lab reports include Tentatively Identified Compounds (TICs). Dave Schroeder replied that they were in the lab reports, and would be included in the RI.

Simeon Hahn recommended that when collecting the Blows Creek samples and other marine samples, that the Navy use the special marine sediment sample methods that are being used at the Washington Navy Yard. These methods yield lower detection limits.

Action Item: Tim will talk to Sherri Eng about the marine sediment sampling methods used at the Washington Navy Yard.

Comments on Tables , Figures, Text

The discussion of the remaining issues contained in the *Summary* handouts regarded workplan comments that involved revising and/or clarifying text, tables, and figures in the individual workplans. Tim Reisch stated that all of the recommended changes were included, and delivered at today's meeting as Attachment 1 to the individual *Summary* handouts . The only revisions not included in these attachments were the SOPs for DPT and hydraulic conductivity testing; those SOPs will be included as attachments to the individual final workplan.

Wrap Up

Tim Reisch stated that many of the primary issues that needed to be resolved were resolved. Some issues still needed additional thought.

Tim requested that the regulators review the revised text, tables, and figures in the attachments of the individual *Summary* handouts. Any comments received on these revisions will be included in the meeting minutes as an attachment.

Tim said that the path forward was to finalize the minutes, finalize the work plans, and get out in to the field. The meeting was adjourned at approximately 4:30 PM.

Attachment A

St. Juliens Creek Site Visit and Review Meeting -Participants December 2, 1998				
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Draft Supplemental Field Investigation Plan Landfill C (Site 3) and Landfill D (Site 4)
St. Juliens Creek Annex Site Chesapeake, VA July 1998
Summary of Response to Comments and Document Revisions

St. Juliens Creek Annex Work in Progress Meeting
December 2, 1998

Technical issues requiring discussion between Navy, EPA, and VDEQ

EPA GENERAL COMMENTS and REPONSE TO COMMENTS

5. The BTAG provided comments on work in progress on ecological risk assessments (ERA) for Landfills C and D in July of 1998. The subject documents state that during the preparation of the ERA as well as during discussions with team members, it became apparent that additional data were necessary to fully define the extent of contamination. It does not appear that proposed sampling addresses the previous comments.

Response: The ERA Work in Progress was intended to present the status of the on-going work at St. Juliens Creek and discuss the overall ERA approach used in the document with the BTAG during a site visit in March 1998. The document was submitted with known data gaps which were discussed during the March meeting; it was not intended to serve as a draft ERA or as a stand alone document. The sampling proposed in the background investigation and the two supplemental field work investigations at St. Juliens included recommendations of the March 1998 meeting. However, BTAG's written comments on the ERA Work in Progress were received after the submittal of the revised draft of the Background Study and two site specific supplemental field investigation work plans.
From the latest comments received (background study and the two supplemental field work investigations) it is acknowledged that additional sampling is required to address the BTAG concerns, see response to comment # 6 below. It is recommended that a St. Juliens Creek site visit and meeting be conducted to jointly locate these additional samples in lieu of one (or both) of the days BTAG is tentatively scheduled to visit NAS Oceana in Virginia Beach.

6. Although a conceptual model or exposure pathway analysis were not presented in the previous work in progress document or the subject documents, the BTAG continues to assert that site characteristics indicate contaminant migration from the above sites to aquatic areas is probable. Therefore, the BTAG reiterates a request to sample the central area of the tidal wetland and St. Juliens Creek in association with Site 2 and Blows Creek, the estuarine emergent marsh, and the confluence of Blows Creek and the Elizabeth River in association with Sites 3, 4, and 5. We note that background (i.e. upgradient) samples are proposed for St. Juliens Creek and Blows Creek. Once these samples are collected a quick screening level risk assessment should be performed following the 1997 EPA Guidance for Conducting Ecological Risk Assessments For Superfund.

Response: The request for sampling St. Juliens Creek for determining possible impacts resulting from past activities involving Landfill B raises some concerns, however, there is agreement that the possibility of contaminant migration from Landfill B to St. Juliens Creek has not been thoroughly addressed.

Concerns associated with St. Juliens Creek sampling are as follows:

- St. Juliens Creek is located in a very industrialized area with the potential for significant environmental impacts from many sources.

- Samples collected from St. Juliens Creek would be expected to contain numerous contaminants resulting from surrounding area industrial activities.

- Determination of environmental impacts (if any) on St. Juliens Creek resulting solely from Landfill B activities appears to be remote based on the potential for significant contribution of contaminants from industrial sources along St. Juliens Creek and the limited contamination identified within Landfill B during the initial site investigation.

  With these concerns in mind but realizing that possible environmental impacts from Landfill B need to be investigated, four (4) "reference samples" are proposed for St. Juliens Creek. Reference samples (surface water and sediment) will be collected at two (2) upstream and two (2) downstream locations of Landfill B. These samples will also be located in depositional environments similar to that observed near Landfill B (e.g., low energy stream flow). The analytical results obtained from these samples will be used in the risk management process and to gain a better understanding of the water quality within St. Juliens Creek. This data will not be used as a screening tool.

  One additional surface water and sediment sample is also proposed at the discharge end of a culvert pipe which directs water from Landfill B into St. Juliens Creek (during high tide water flow is actually reversed and flows into the Landfill B site). In addition, during the initial site investigation, one (1) surface water and one (1) sediment sample was collected at the mouth of the culvert which exits the Landfill B area. Both of these locations are most representative of contaminants potentially exiting the Landfill B area and impacting St. Juliens Creek. This data and other ecological site data would be used as part of the ecological risk screening process.

  Sampling within Blows Creek also raises some concerns. Due to the tidal impact of the Elizabeth River on the water levels within Blows Creek, and the potential for "washing" contaminants into Blows Creek from the Elizabeth River, surface water and sediment samples would be expected to contain contaminants from the numerous industrial sources in the area. Sampling locations within Blows Creek may not provide helpful site specific assessment data; however, during the initial investigations locations within tributaries exiting a site and entering Blows Creek were sampled to determine the extent of any site related contamination. Additional sample locations following this rationale are proposed for the supplemental field investigation.

  During the initial site investigation of the Burning Grounds, two (2) sediment samples were collected immediately north of Blows Creek and south of the site. These samples were found to be more similar to surface soils due to the very limited intermittent flow in this area. However, sampling this area is expected to identify any possible surface water/overland flow contamination originating in the Burning Grounds and entering into Blows Creek. Therefore, three (3) additional surface soil sample locations are proposed for this area.

  Landfill D will also be sampled at points downgradient/downstream of the site but prior to entering Blows Creek. Currently, four (4) surface water and four (4) sediment samples are proposed for Landfill D in tributaries flowing into Blows Creek (2 surface water/sediment sample locations were sampled during the initial site investigation). The proposed sample locations are expected to identify any possible surface water/sediment contamination originating in Landfill D and entering into Blows Creek.

  Surface water/sediment locations associated with Landfill C are areas of ponded water. No drainage ways or overland flow from Landfill C into either the Elizabeth River or Blows Creek have been observed. As a result, no direct impacts from Landfill C would be expected.

Technical issues resolved in Response to Comments, clarification of issues and revised sections of the workplan

- The text of Section 1.0 has been revised to include the historical usage of Landfill C and Landfill D. Also the sentences "(See Section 1.0 for summary of Landfill C historical usage.)" and "(See Section 1.0 for summary of Landfill C historical usage.)" have been added to Sections 3.3 and 3.4, respectively. These revisions were made as stated in the response to EPA General Comment # 4.

- The sentence, "Surface soil samples will be collected from depths of 0.0-6.0 inches bgs." was added to Sections 3.3.3 and 3.4.2. This was added in response to EPA General Comment # 7 and VDEQ Comment # 3.

- The interval for collecting subsurface soil samples in Sections 3.3.2 and 3.4.1 was changed from "0.25-2.0 ft bgs" to "0.0-2.0 ft bgs". Also the text of second paragraphs of Section 3.3.2 and the first paragraph of Section 3.4.1 was revised to explain why soils deeper than 2.0 ft will not be added to the composite sample.

  The text was:

  "... The subsurface soil samples will be a composite sample collected from a depth of 0.25-2.0 ft bgs. This depth, considered appropriate for evaluation of risk to burrowing animals, was selected based on conversations with the BTAG. All borings will extend beyond 2 ft to the water table. ..."

  The text is now:

  "... The subsurface soil samples will be a composite sample collected from a depth of 0.0-2.0 ft bgs. This depth is considered appropriate for evaluation of risk to burrowing animals. At the SJCA depth to groundwater is typically 3 ~~-~~ 5 ft bgs which limits the borrowing depth due to saturated soil conditions. In addition, a composite sample collected from an interval greater than 0.0-2.0 ft may not be representative due to "dilution" of the larger sample composite. All borings will extend beyond 2 ft to the water table. ..."

  These were revised as stated in the response to EPA General Comment # 7, VDEQ Comment # 2, and VDEQ Comment # 7.

- The analysis for low level VOC has been added to Tables 3-2 and 3-4 (See Attachment 1) for groundwater, as recommended in EPA Specific Comment # 11. Surface water samples will not be analyzed using low-level methods to stay consistent with previous investigation activities; however, this analysis will be considered, if these data and the data from the previous sampling events can be used together in determining both human health and ecological risk concerns.

Comment recommendations incorporated into revised sections of the workplan

- A list of abbreviation and acronyms have been added to the WP following the table of contents (See Attachment 1), as recommended in EPA General Comment # 1.

- The sentence, "The Final Landfill B and the Burning Grounds Work Plan, dated May 1997 should be referenced for pertinent information regarding this Supplemental Site Investigation Plan." has been added to the third paragraph of Section 1.0, as recommended in EPA General Comment # 2.

- Analysis for total phosphorus has been added to Tables 3-2 and 3-4 (See Attachment 1) for surface water samples, as recommended in EPA General Comment # 3, Specific Comment # 4, and Specific Comment # 9.

- The second sentence in the Sample and Analysis Rationale box for surface soils in Table 3-2 (See Attachment 1) has been revised to include stating Method 8015M will be use for TPH analysis.

  It was:

  "Will analyze for TPH to identify oily sludges reported to be disposed at the Landfill."

  it is now:

  "Will analyze for TPH, by Method 8015M, to identify oily sludges reported to be disposed at the Landfill."

  In addition, this later sentence will be included in Section 3.3.1 according to recommendations in EPA Specific Comment # 2.

- Analysis for TOC in subsurface soil samples has been removed from Table 3-2 (See Attachment 1), as recommended in EPA Specific Comment # 3.

- Analysis for TOC in surface water samples has been removed from Table 3-3 (See Attachment 1) and analysis for total phosphorus has been added to surface waters in Tables 3-2 and 3-4 (See Attachment 1), as stated in the response to EPA Specific Comment # 4

- The analysis for total phosphorus and TOC has been added to Tables 3-2 and 3-4 (See Attachment 1) for sediment samples, as recommended in EPA Specific Comment # 5 and Specific Comment # 10.

- Figure 3-3 has been included to the WP which shows Landfill C and Landfill D in relation to each other and the four surface soil sample locations between the two sites (see Attachment 2), as recommended in EPA Specific Comment # 7, VDEQ Comment # 4, and VDEQ Comment # 9. Also, the sentence, "The locations of the proposed additional sampling between the Landfill C and Landfill D sites are shown in Figure 3-3." has been added to Section 3.4.2. Furthermore, Figure 3-3 has been added to the table of contents.

- A new Section 3.4.3 has been added to discuss sampling of ground water at Landfill D.

  Section 3.4.3 states:

  "The RI investigation indicated that six monitoring wells located near the perimeter of Landfill D were adequate for collecting the necessary groundwater samples. Therefore no new monitoring wells will be installed and groundwater samples will be collected from the existing six wells."

  The original Section 3.4.3 and all following sections have had their section numbers adjusted as appropriate. This was added as recommended in EPA Specific Comment # 8.

- The text of the third paragraph of Section 3.3.1 has been revised to clarify and add detail to sampling procedures.

  The text was:

  "Two aliquots of soil will be collected from each boring. One aliquot will be analyzed in the field with a semiquantitative immunoassay test for petroleum hydrocarbons. The results of the field screening will be used to select 4 samples for full analysis as described below."

  The text is now:

  "The samples will be collected using a direct push technology rig and a 4-ft long Macro Core sampling devise or equivalent. The core samples will be examined for visible indications on waste material.

  If there is no visual evidence of waste material, a composite sample of the soil core will be placed in a jar (until the jar is approximately half full) for headspace analysis. The remaining sample from each 2-ft section will be placed in a separate container for hydrocarbon analysis utilizing a field test kit (the Dexsil® PetroFLAG® Test System) The headspace jar will be sealed with aluminum soil, the lid will be placed on the jar, and the jar will be allowed to warm to room temperature. The lid will be removed and the probe of a photoionization detector inserted through the aluminum foil. A reading of the vapors present in the "headspace" of jar will be made. The sample with the highest headspace reading will be analyzed for hydrocarbon using the field test kit.

  Four samples will be sent to the off-site laboratory for "full analysis." In selecting the 4 samples for off site laboratory analysis, samples with visual contamination will be selected first and samples of soil with the highest measurement of hydrocarbons in the field analysis will be selected second. If additional samples are required in order to submit 4 samples, soil with elevated headspace readings (above ambient) will be sent."

  In addition, the SOP for the DPT sample collection has been added to the WP as Attachment 1. The sentence, "The standard operating procedure for DPT sample collection borings is presented in Attachment 1." has been added to the first paragraph of Sections 3.3.1 and 3.4.1. Furthermore, "Attachment 1" has been added to the table of contents.

  These revisions were made as recommended in VDEQ Comment # 1.

- In Section 3.1.1 the sentence, "Boreholes resulting from subsurface soil sampling activities will be sealed with hydrated bentonite powder or pellets." has been added to the third paragraph, as recommended in VDEQ Comment # 2.

- The text "If there is no visual evidence of waste material, a composite sample of the soil core will be placed in a jar (until the jar is approximately half full) for headspace analysis. The headspace jar will be sealed with aluminum soil, the lid will be placed on the jar, and the jar will be allowed to warm to room temperature. The lid will be removed and the probe of a photoionization detector inserted through the aluminum foil. A reading of the vapors present in the "headspace" of jar will be made. This data will be used to determine which sample or will be sent for off-site laboratory analysis, or if an additional sample will be collected for analysis." has been added to the last paragraph of Sections 3.3.2 and 3.4.1, as stated in the response to VDEQ Comment # 8.

- The first sentence of Section 3.4.2 was revised from:

  "A surface soil sample will be collected at each of the 5 subsurface soil sample locations for use in the ecological and human health risk assessment, and to confirm that the extent of surface soil contamination is confined to the landfill surface."

  to:

  "A surface soil sample will be collected at each of the 5 subsurface soil sample locations for use in the ecological and human health risk assessment, and to confirm and define the site boundaries and also to confirm that the extent of surface soil contamination is confined to the landfill surface."

  Also the sentence " If a sample is determined to be outside the boundaries of the landfill it will not be used for the HHRA." was added as the second sentence in the section. The section was changed as stated in the response to VDEQ Comment # 9.

- The SOP for the hydraulic conductivity test has been added to the WP as Attachment 2, as recommended in VDEQ Comment # 11. Also, the sentence, "(The standard operating procedure for the hydraulic conductivity test is presented in Attachment 2.)" has been added to the first paragraph of Section 3.5.2 in reference. Furthermore, "Attachment 2" has been added to the table of contents.

- The sentence, "All newly installed monitoring wells will be given a minimum of 24 hours between well construction and well development." has been added to of Section 3.3.4. Also the paragraph "After well development all wells will be allowed to recover at least 12 hours prior to slug testing or the tidal study. Additionally, all wells will be allowed to recover at least 12 hours between the slug test and the tidal study. These time intervals may be increased if experience with newly installed wells indicates that more time is needed to recover." was added to Section 3.5.2. These were added as recommended in VDEQ Comment # 13.

ATTACHMENTS

Attachment 1: Revised Tables

Table 3-2
Table 3-3
Table 3-4

Attachment 2: Revised Figures

Figure 3-3

Standard Operating Procedures

Direct Push Technology (DPT) - Attachment 1 to Supplemental Workplan
Hydraulic Conductivity - Attachment 2 to Supplemental Workplan

ATTACHMENT 1

ABBREVIATIONS AND ACRONYMS

Abbreviations and Acronyms

BERA ..... Baseline Ecological Risk Assessment

bgs ..... below ground surface

BTAG ..... Biological Technical Assistance Group

COPC ..... chemical of potential concern

CTO ..... Contract Task Order

DPT ..... direct push technology

EPA ..... United States Environmental Protection Agency

FS ..... feasability study

HHRA ..... Human Health Risk Assessment

PCB ..... polychlorinated biphenyl

PVC ..... Polyvinyl Cholide

RI ..... remedial investigation

SVOC ..... semivolatile organic compounds

TAL ..... target analyte list

TCL ..... target compound list

TOC ..... total organic carbon

VDEQ ..... Virginia Department of Environmental Quality

VOC ..... volatile organic compounds

ATTACHMENTS 2

TABLES

TABLE 3-2
LANDFILL C PROPOSED SAMPLING AND ANALYSIS STRATEGY

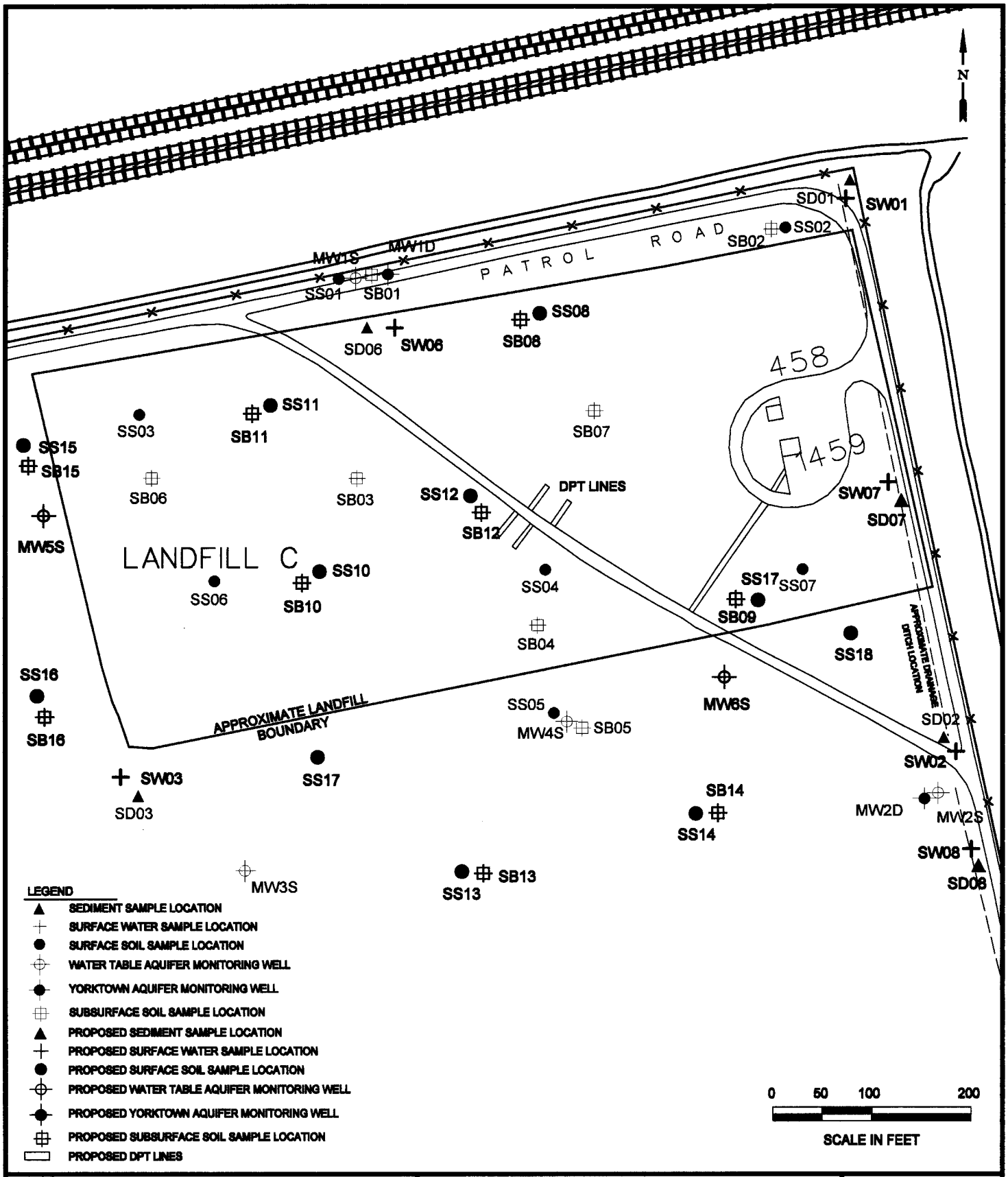
MEDIA/ ACTIVITY	OBJECTIVE	NUMBER OF SAMPLES	ANALYTE GROUP	SAMPLE AND ANALYSIS RATIONALE
Surface soil	Provide additional data for the HHRA and BERA. Define extent of surface soil contamination.	11	TCL/TAL metals TPH	Samples are located to the south east and west of the area where VOCs were detected in subsurface soil. Will analyze for TPH, by Method 8015M, to identify oily sludges reported to be disposed at the Landfill.
Subsurface Soil	Identify waste disposal areas. Provide subsurface soil data suitable for BERA.	13	TCL/TAL metals Field screening of DPT samples with Immunoassay field test kit for TPH.	Will use DPT to explore subsurface along four lines perpendicular from the road that crosses the site. Disturbed soil in the area is shown on historical aerial photographs. will screen with field tests and select 4 samples for full analyses. Other soil samples for BERA (characterize near-surface habitat of burrowing animals) will analyze for full suite of constituents.
Groundwater	Determine direction of groundwater flow. Identify nature and extent of groundwater contamination.	8	TCL/TAL metals (filtered and unfiltered) Low level VOC Total phosphorus	Two new shallow wells will be screened in the shallow aquifer to determine groundwater flow direction. Location selected is expected to be downgradient of area where VOCs were detected in subsurface soil. All wells will be sampled.
Surface Water	Determine nature and extent of contamination in surface water.	6	TCL/TAL metals (unfiltered) Total phosphorus Salinity (field measurement)	No previous samples have been collected due to dry conditions. Locations selected in low areas and drainage features. Paired with sediment sampling locations.
Sediment	Refine extent of contamination.	2	TCL/TAL metals Total phosphorus TOC	Elevated levels of metals detected in sample from drainage ditch. Proposed samples will be located upstream and downstream of that sample in order to more accurately define extent of contamination.

TABLE 3-4
LANDFILL D PROPOSED SAMPLING AND ANALYSIS STRATEGY

MEDIA/ ACTIVITY	OBJECTIVE	NUMBER OF SAMPLES	ANALYTE GROUP	SAMPLING AND ANALYSIS RATIONALE
Surface Soil	Determine extent of contamination in surface soil adjacent to the landfill. Characterize dredge spoils	12	TCL/TAL metals	Selected locations are adjacent to the landfill to the north and west (a road is to the east and Blows Creek is to the south).
Subsurface Soil	Provide subsurface soil data suitable for BERA. Confirm lateral extent of waste.	5	TCL/TAL metals	Characterize near-surface habitat of burrowing animals. Located immediately adjacent to landfill on the north, south and west (borings to the east were sampled previously).
Groundwater	Additional monitoring data. No new monitoring wells will be installed.	6	TCL/TAL metals (filtered and unfiltered) Low level VOC	Collect samples from existing wells for comparison to previous sample results.
Surface Water	Refine extent of contamination in surface water. Sample locations that were previously dry during sampling event.	7	TCL/TAL metals (unfiltered) Total phosphorus Salinity (field measurement)	Previous surface water sample from Blows Creek was contaminated. Proposed samples will be used to further define extent. In addition, samples will be collected from drainage ditch that was dry during a previous sampling event.
Sediment	Refine the extent of contamination.	4	TCL/TAL metals Total phosphorus TOC	Locations selected to further define the sediment contamination found in a sample collected in Blows Creek during the previous sampling event . Locations are selected to be upstream and downstream of the previous sample.

ATTACHMENT 3

FIGURES



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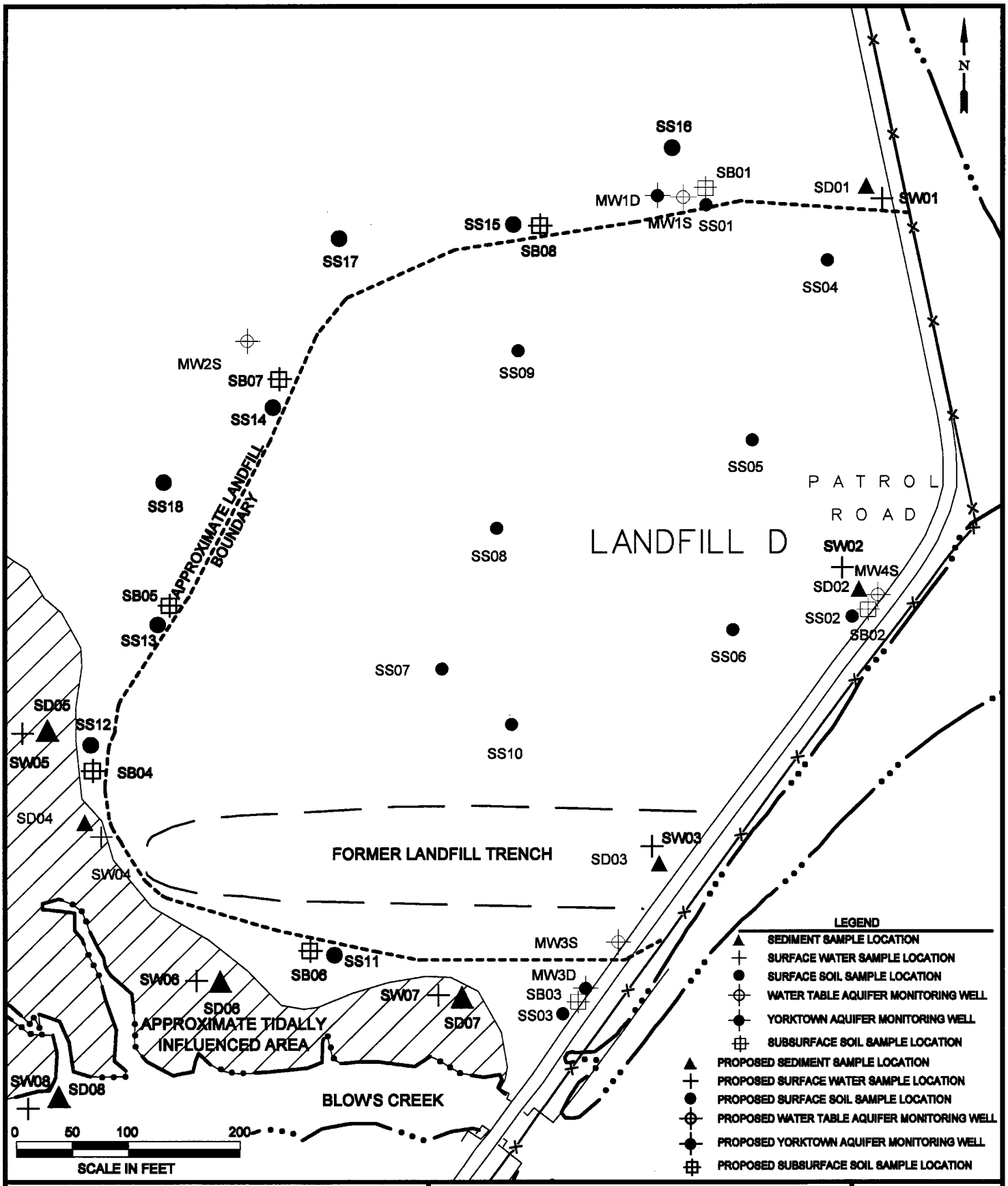
EXISTING AND PROPOSED SAMPLING LOCATIONS, SITE 3 SAINT JULIENS CREEK ANNEX

FIGURE 3-1



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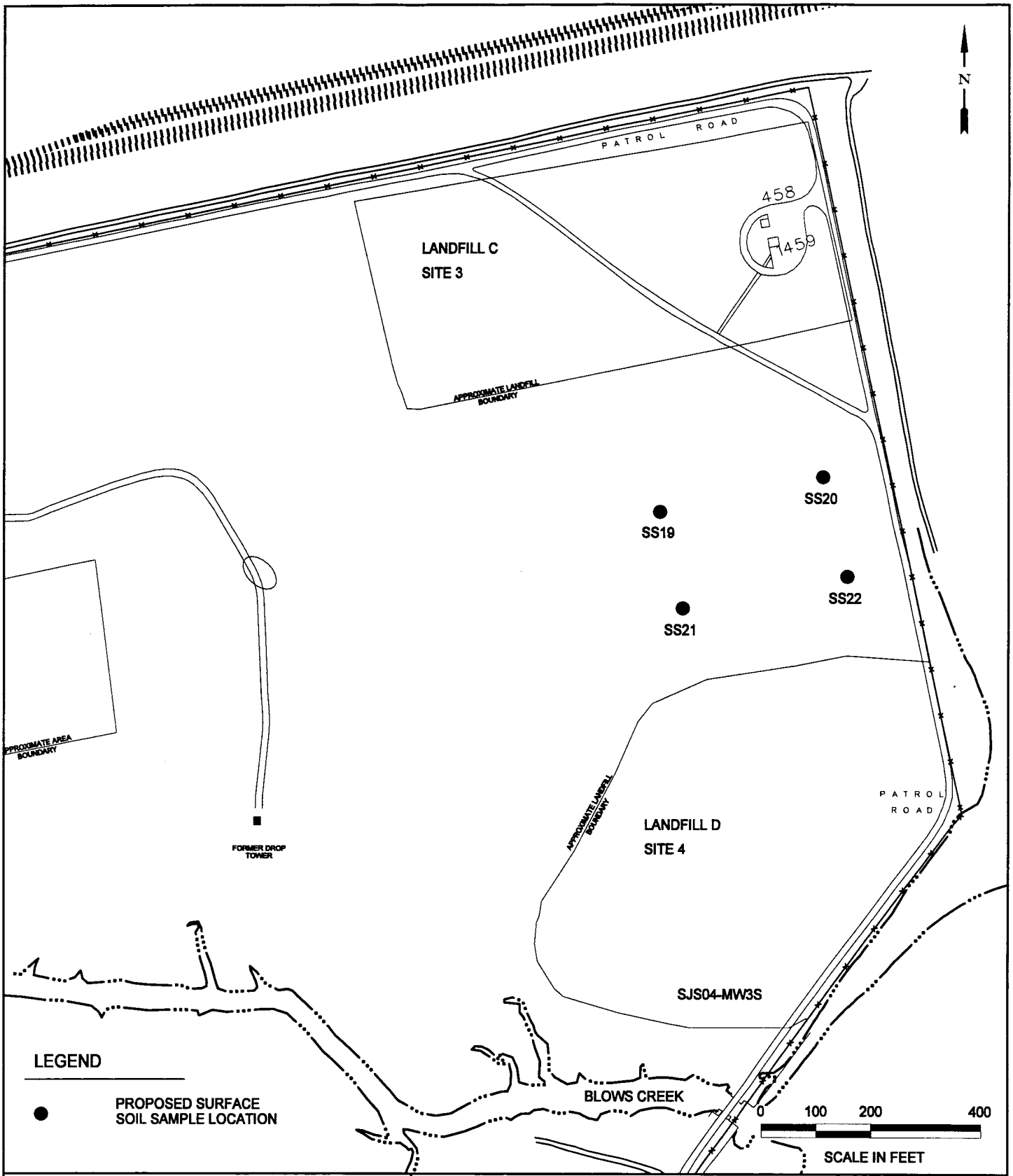
EXISTING AND PROPOSED SAMPLING LOCATIONS, SITE 4
SAINT JULIENS CREEK ANNEX

FIGURE 3-2



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PROPSED SAMPLING LOACTIONS, BETWEEN SITES 3 AND 4 SAINT JULIENS CREEK ANNEX

FIGURE 3-3